DOCUMENT RESUME

ED 369 707 SO 023 904

AUTHOR	Pauly, Nancy; And Others
TITLE	Interdisciplinary Learning and the Arts: An Annotated Bibliography, July 1993. Second Edition.
INSTITUTION	Minnesota Center for Arts Education, Golden Valley.
PUB DATE	Jul 93
NOTE	33p.
AVAILABLE FROM	Minnesota Center for Arts Education, 6125 Olson Memorial Highway, Golden Valley, MN 55422 (Braille and large print editions also available).
PUB TYPE	Reference Materials - Bibliographies (131)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Administrator Attitudes; Annotated Bibliographies; *Art; *Art Education; *Curriculum Design; *Curriculum Development; Curriculum Research; Elementary Secondary Education; *Interdisciplinary Approach; Student Attitudes; Teacher Attitudes; Units of Study
IDENTIFIERS	Minnesota

ABSTRACT

The 107 citations in this annotated bibliography reflect diverse perspectives on curriculum integration and the arts. Annotations of periodicals, journal articles, books, school curriculum guides, and program guides are included. Section 1 provides 34 citations on general interdisciplinary concepts from curriculum design to implementation. Section 2 offers 30 citations on interdisciplinary education in relation to the arts and art education. Section 3 presents 36 citations on interdisciplinary curriculum units and lesson plans with arts as a focus. Section 4 contains eight citations that cover interdisciplinary curriculum units and lesson plans from disciplines other than the arts. The final section provides nine citations of anecdotal and empirical studies on the attitudes and perceptions of administrators, teachers, and students who have experienced interdisciplinary learning. (CK)

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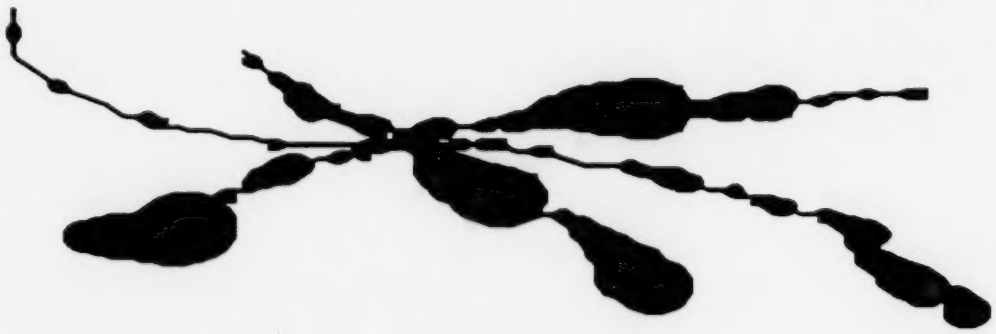

Edited by
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June, 1992

HOW TO ACCESS RESOURCE MATERIALS

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If you are unsuccessful in locating, or unable to obtain the materials listed on the bibliography through local resources, please contact us. We have all the monographs and journal articles listed in the bibliography. If you would like to have copies of a few of the articles, please call or send your written request for up to three articles to Jim Marshall, Media Specialist, in our Learning Resource Center (LRC). He will coordinate duplication and mailing of the item(s) to you.

If you would like to access the books listed on the bibliography or would like to have access to our broader collection, you may wish to become a member of our LRC. We are piloting a new service for school districts, arts organizations and individuals to become members. You may come in and check out materials if you have a membership or request to have books mailed to you. Membership fees are $25 per year for organizations and $15 annually for individuals.

If you have questions about these procedures or would like more information about membership in our Learning Resource Center, please contact Jim Marshall at 612-591-4702 or toll free, 1-800-657-3515. Thanks for your efforts to enhance students' education through interdisciplinary learning opportunities. I hope you find this bibliography and access to the resources helpful.

Pamela N. Paulson, Ph. D.
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What is the Minnesota Center for Arts Education?

This project is made possible in part through support of Resource Programs, the educational outreach component of the Minnesota Center for Arts Education. The Center was established by the Minnesota Legislature in 1985 to enhance and develop arts education through statewide Resource Programs and a residential Arts High School program.

Designed to meet the diverse needs of Minnesota's students and teachers (K-12), the Center's Resource Programs includes:

- unique multi-year initiatives - such as the Dance Education Initiative;
- professional development support for teachers and artists - such as the Professional Opportunities Program (or POP);
- annual statewide summer workshops - such as the Minnesota Arts eXperience (or MAX);
- leadership development, conferences and seminars on emerging arts education issues - such as the Interdisciplinary Learning Seminar; and
- information dissemination through publications and special interest papers - such as this bibliography.

In addition, various aspects of the Arts High School are offered statewide through the Magnet Arts Program and other programs which promote sharing and interaction among arts and education professionals.

For more information about Center programs write: Minnesota Center for Arts Education, 6125 Olson Memorial Highway, Golden Valley, MN 55422. Phone: 1-800-657-3515 (toll free) or 1-612-591-4700.

INTRODUCTION

"The interdisciplinary form of learning and teaching has changed the way I look at everything. The result is that you get excited, nothing is ever stale. This mode of teaching says 'YOU ARE NEVER FINISHED!' — new connections are always going to come to mind. You open your thinking about everything more broadly."

- Pat Feit, Lead Teacher, "Creative Connections", Princeton Public Schools

While using curriculum integration in the classroom is not a new concept -educational planners have explored interdisciplinary approaches and concepts at various times throughout the history of American education - the revival of interest on this topic can have a profound impact on education today. Indeed, this resurgence of interest is not surprising given the present climate of educational reform, and burgeoning local, and national efforts to restructure schools and more effectively address diverse student needs.

This literature review reflects many of the diverse perspectives and viewpoints about curriculum integration, ranging from those addressing specific interests of individual teachers and schools to include broad societal perspectives on the current climate of public education. Some of the following are cited in this bibliography as factors contributing to the renewed interest in interdisciplinary learning:

- There is widespread concern about the onset of the "technology and information age" and changing societal roles. These concerns are related to the quantity and quality of information and type of knowledge to be addressed in schools. Integrated approaches may make learning more efficient.

- The present structure of schools - one that promotes teaching of specific disciplines or subjects - can be fragmented and does not necessarily reflect real life. Interdisciplinary studies may provide relevant connections between coursework and student's lives outside school.

- Changes in the way curriculum and learning is structured have prompted new thinking. One example at the center of school reform efforts is outcome-based education (OBE). The potential role of curriculum integration in shaping student learning in these types of contexts is currently under examination.

- Teachers often note that students need a range of learning experiences which reflect both discipline-based and interdisciplinary orientations. There is a general feeling that when interdisciplinary approaches are used, relationships between individual disciplines are demonstrated and relevance or meaningfulness is heightened for students.

- Teachers have also expressed interest in creating more efficient ways to balance new curriculum demands, especially in light of the burgeoning educational reform movement, the changing role(s) of teachers in the learning process and state and national mandates. The effect of interdisciplinary learning in light of these changes has yet to be determined.

There appears to be great diversity and some confusion about what constructs the interdisciplinary education approach. The literature surveyed in this bibliography reflects some of this confusion; Terms such as interdisciplinary approach, multi- or cross-disciplinary curriculum, correlated learning or core curriculum are used interchangeably to describe curriculum integration. A recent book edited by Dr. Heidi Hayes Jacobs, entitled "Interdisciplinary Curriculum: Design and Implementation," is cited in this bibliography as one of the most comprehensive works available. It presents a framework for understanding curriculum integration in a broad context, and establishes some boundaries for implementing and designing interdisciplinary learning experiences.

This bibliography was originally developed for participants of a statewide conference entitled, "A Dialogue on Interdisciplinary Arts Education" (sponsored by the Minnesota Center for Arts Education, April, 1991, at Riverwood Conference Center, Monticello, MN). The "Dialogue" conference explored the role, value and use of interdisciplinary approaches and introduced participants to many examples of interdisciplinary learning taking place in Minnesota schools.

The Conference was only one part of Center efforts to explore interdisciplinary learning and the arts and to respond to teachers requests for more information about classroom application of interdisciplinary approaches. The annual Interdisciplinary Learning Seminar, designed for teams of teachers to experience and develop interdisciplinary curriculum first-hand, and to learn new approaches for assessing student learning using outcome-based education, is another example of the Center's on-going commitment to interdisciplinary study. In addition, a research report

describing student and teacher perceptions of the interdisciplinary program at the Arts High School is available from the Center. The report's Introduction traces the development of the interdisciplinary program through its many adaptations and changes during the first two years of implementation. Information gained from focus group participants in the study has been used to further refine the present curriculum structure and offerings.

In its present form of over 80 citations, this bibliography combines literature in arts education, education reform, curriculum design and instruction. It includes annotations of periodical and journal articles as well as books and school curricula or program guides. The number of recent citations on this subject suggest a vitality of research and interest. However, though it is representative of the kind and quality of literature available, this working bibliography should not be considered an exhaustive listing.

The publication should interest professionals of diverse backgrounds, experience levels, subject and grade-levels. We hope that it is useful for teachers and researchers as well as members of education and arts education professional and service communities.

Finally, the Minnesota Center for Arts Education Resource Programs wishes to acknowledge Janet Parker for her diligence researching, writing, and preparing citations and annotations and Nancy Pauly for her expertise writing annotations and editorial advice. We also would like to thank many other individuals who contributed to material and literature sources and provided valued reviews, including: Pam Paulson, Mark Youngstrom, Karon Sherarts, Merill Fellger, Pat Roles, Peggy Piepho-Duda, Jeanne Iverson and Jim Marshall. If you know of additional information or research on this topic, please feel free to contact the Minnesota Center for Arts Education at 1-800-657-3515 (toll free) or 1-612-591-4700.

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GENERAL INTERDISCIPLINARY CONCEPTS FROM CURRICULUM DESIGN TO IMPLEMENTATION

The articles and books in this section offer broad definitions of interdisciplinary education and present a diversity of perspectives as to its relevance for learning and the educational process. Included are general research conclusions, examples of model programs, and ideas for the organization, design and implementation of interdisciplinary approaches. Some citations also include information on specific program design, assessment and evaluation.

Bauman, M. G. (1989, Spring). Interdisciplinary studies for the twenty-first century. National Forum: Phi Kappa Phi Journal, 69(2), 38-41.

• The author argues that a broad liberal arts education affords people the breadth of knowledge to grapple with problems of the 21st century. Future liberal arts education should help students integrate learning in four general areas: global studies, self-reliance skills, interdisciplinary thinking and selected traditional studies.

Boyer, E. L. (1982, May). Seeing the connectedness of things. Educational Leadership, 582-584.

• This article suggests ways for educators to reaffirm the importance of shared community experiences to give meaning to students' lives. To help restore a balance in education the author proposes six themes: 1) shared use of symbols as a foundation of common learning; 2) shared membership in groups and institutions; 3) shared experiences of producing and consuming; 4) shared relationships with nature; 5) shared sense of time; and 6) shared values and beliefs.

Brandt, R. S. (Ed.). (1991, October). Integrating the curriculum (Special issue). Educational Leadership, 49(2).

• This publication takes a comprehensive look at interdisciplinary education through a number of articles written by well known educators in the field, such as Dr. D. N. Perkins, Dr. Gordon F. Vars and Dr. Heidi Hayes Jacobs. The articles cover theoretical to practical perspectives in the disciplines of humanities and science and provide examples of team planning being used in various schools. Concluding articles written by Jean A. King and Karen M. Evans (Center for Applied Research and Educational Improvement at the University of Minnesota) and by Dr. William Spady, present historical perspectives of outcome based education.

Brandt, R. S. (1991, October). On interdisciplinary curriculum: A conversation with Heidi Hayes Jacobs. Educational Leadership, 49(2), 24-26.

• In this interview Jacobs provides three reasons why interdisciplinary curriculum is high priority for ASCD members: new knowledge does not fit into conventional subjects, students' call for relevancy and expressed need for connections between school subjects and everyday life, and the belief that related topics should be taught concurrently in order to increase student understanding. Time and personal barriers provide obstacles to interdisciplinary planning at the high school level where

teachers identify too strongly with their respective subject areas. Teachers need common planning time to discuss what and how they teach. Schools should gather information about what is taught and then ask, "What could we do that might make more sense?" This approach may lead to grade level connections, multi-grade collaborations, or school-wide themes completed with student input. After reflecting on possibilities, Jacobs suggests schools do one, well-designed, meaningful, interdisciplinary unit.

Brophy, Jere. A Caveat: Curriculum Integration Isn't Always a Good Idea. Educational Leadership.

• This article makes a case for the selective use of an integrated curriculum. Brophy and Alleman argue that too often interdisciplinary activities become pointless busywork, instead of accomplishing important educational goals.

Cohen, M. (1978, November). Whatever happened to interdisciplinary education? Educational Leadership, 36(2), 122-126.

• The author maintains that systems interact. She uses an example from ecology where "DDT as chemical triumph" is contrasted with the disastrous biological and social implications of its world-wide use. The justification educators need to prepare youth for a world of increasingly complex knowledge requiring synthesis and teamwork is also noted. The article cites interdisciplinary education's historical precedence from teaching Latin in colonial times, thematic teaching in the 1930s, to ethnic and regional studies offered in the 1950s and 1960s.

Dillon, J. T. (Ed.). (1988). Questioning and Discussion: A Multidisciplinary Study. Norwood, NJ: Ablex.

• This book reports on a multidisciplinary research project intended to enhance the multidisciplinary pursuit of questioning and discussion in classrooms. In the first half of the book, scholars from divergent disciplines (philosophy, sociolinguistics, social psychology, logic, and cognitive developmental psychology) analyze the same set of five transcripts from the classroom discourse. In the second half, classroom researchers analyze the transcripts from various pedagogical perspectives. An appendix includes the five transcripts.

Fogarty, R. (1991, October). Ten ways to integrate curriculum. Educational Leadership, 49(2), 61-65.

• The author presents 10 model schools may use to present or integrate curriculum. The Fragmented model separates knowledge into distinct disciplines. The Connected model focuses on making connections within a discipline. The Nested model incorporates multiple skills within a lesson. In the Sequential model, schools arrange class content so that related subjects are taught at the same time. The Shared model involves shared planning and teaching time in order to overlap two subjects. In the Webbed model, teachers use a theme to integrate subjects. The Threaded model weaves thinking skills, social skills, study skills, graphic organizers, technology and multiple intelligences approaches to learning throughout all disciplines. The Integrated model blends disciplines to find overlapping skills, concepts and attitudes. The Immersed model focuses on learners whose extreme interest in one subject causes them to connect all subjects. The Network model is one in which the learner networks with people from many disciplines to explore a subject.

Gamberg, R., Kwak, W., Hutchings, M., & Altheim, J. (1988). Learning and Loving it, Theme Studies in the Classroom. New Hampshire: Heinemann Books.

• This book describes a student centered, theme study approach to learning. It follows the curriculum during one academic year at Dalhousie University Elementary School in Halifax, Nova Scotia. The first chapters introduce the theme study approach as a holistic approach to learning. Rather than compartmentalized subject areas, it includes the study of broad themes such as "People and Their Work." Several chapters outline several large-scale theme studies and emphasize students as active participants in their own learning (such as older students actually building a playhouse). Other chapters on specialized theme studies describe collaborative projects between children and teachers (such as setting up and operating a lunch business). The final chapters present teachers' and parents' concerns and note the qualities of the evaluation process as it differed from more standardized methods.

Gawronski, J. D. & Fehlen, J. E. (1977). Organizing for alternative schools: An integrated curriculum. National Council of Teachers of Math, 169-185.

• The authors propose an integrated curriculum for an open school setting. They suggest many concrete projects that focus on integrating math with other subject areas by charting or graphing information, such as recording scores and players' averages in athletic events. Teachers are also encouraged to keep records and check lists for each student as a way to evaluate strengths, skills and knowledge.

Guskey, T. R. (1990, February). Integrating innovations. Educational Leadership, 47(5), 11-15.

• This author maintains that school leaders should be responsible for selecting new educational innovations that are best for their school. He discusses how new educational innovations are selected and integrated into existing curriculum. Five guidelines aid educators in examining new educational plans for successful integration.

Huber, T. (1988, Summer). STS: Bonding humanities and technology. Journal of Curriculum and Supervision, 3, 344-347.

• This author reports on the Science through Science, Technology and Society (S-STS) project at Pennsylvania State University's education department. She outlines research, conferences and other features of programs in Science, Technology and Society (STS). The need for interconnecting science, technology and the humanities in schools is further promoted by listing positive evidence of the program's effectiveness on student's learning.

Jacobs, H. H. (Ed.). (1989). Interdisciplinary Curriculum: Design and Implementation. Alexandria, VA: Association for Supervision and Curriculum Development.

• This book contains a collection of articles by various authors which address issues related to the development and implementation of interdisciplinary curriculum. The following topics are covered: the need for interdisciplinary curriculum, design options, intellectual and practical criteria for success, descriptions of two model programs, a step by step development approach, suggestions for themes, and ideas for implementing thinking and learning across the curriculum. This book is probably one of the best, single works on the topic published thus far and is highly recommended.

Jacobs, H. H. (1991, October). Planning for curriculum integration. Educational Leadership, 49(2), 27-28.

• The author recommends four phases to develop interdisciplinary curriculum over a three-year time frame. During phase one, "Action Research," teachers concentrate on learning current curriculum by plotting units on a monthly chart to align curriculum, eliminating repetition and identifying interdisciplinary links. During phase two, "Develop a Proposal," teachers assess potential areas for interdisciplinary units and design a pilot unit for 2 to 6 weeks. During phase three, "Implement and Monitor Pilot," teachers teach the lessons and meet frequently to evaluate their efforts. During phase four, "Adopt the Program," the pilot is adopted as a permanent part of the curriculum.

Jacobs, H. & Borland, J. (1986, Fall). The interdisciplinary concept model: Theory and practice. Gifted Child Quarterly, 30, 159-163.

• The authors describe why and how interdisciplinary units should be developed for and with gifted learners. The author highlights several instructional strategies and recommends the exploration of knowledge, the blending of thinking and content skills, the use of both discipline-centered and interdisciplinary approaches and the involvement of students in unit development. A four-step plan for developing interdisciplinary units is presented, which includes: selecting a worthwhile topic, brainstorming associations, deciding on guiding questions, and designing and implementing activities.

Kersh, M. E., Nielsen, M. E., & Subotnik, R. F. (1987, Fall). Techniques and sources for developing integrative curriculum for the gifted. Journal for the Education of the Gifted, 11(1), 56-68.

• This article describes the appropriateness of an integrated curriculum for gifted learners and presents a series of steps used to design integrated units. It delineates problem solving processes common to most disciplines such as understanding a problem's content, developing theories, noting patterns, developing models, finding evidence, making predictions, experimenting and making adaptations. A unit using patterns as the theme is described.

King, J. A. & Evans, K. M. (1991, October). Can we achieve outcome-based education? Educational Leadership, 49(2), 73-75.

• The authors, both from the Center for Applied Research and Educational Improvement, University of Minnesota, discuss possible origins of outcome-based education (OBE) and research findings in Minnesota. Ralph Tyler's (1950) basic text on curriculum and instruction is sited as a precursor of OBE. In this book, Tyler notes the importance of the objective for systematic planning and evaluating educational experiences in behavioral terms. Other pioneers are Glaser (1963) with criterion-referenced measurement, mastery learning, and competency-based education. The authors' experience in Minnesota suggests that OBE implementation requires massive curriculum development efforts, attention to enrichment and remediation, new forms of performance assessment tools and extensive staff development.

MacIver, D. J. (1990, February). Meeting the needs of young adolescents: Advisory groups, interdisciplinary teaching teams, and school transition programs. Phi Delta Kappan, 71, 458-464.

• This interdisciplinary middle school research concluded that interdisciplinary teams (if they have a leader and sufficient planning time) increase the effectiveness of instruction, provide teachers a support system, insure student problems are recognized, improve student work and attitudes, and have a positive effect on the overall middle school program. The article contends that sixty-three percent of middle schools do not use interdisciplinary teaming and those that do, provide insufficient planning time.

Melle, M. & Wilson, F. (1984, April). Balanced instruction through an integrated curriculum. Educational Leadership, 41(7), 59-63.

• This article describes the Primary Integrated Curriculum implemented at elementary schools in Jefferson County, Colorado. It describes ten learning units developed for first grade and nine learning units for second grade classes. The units are action centered, requiring students to blend concepts and skills from all disciplines to solve problems. One such unit focused on patterns in the human-made and natural environments.

Miller, G. E. (1988). The Meaning of General Education: The Emergence of a Curriculum Paradigm. New York: Columbia University, Teachers College Press.

• This book draws on 20th century history to put general education into a broader institutional and social context. The first few chapters cover the first four decades of the twentieth century and describe how general education evolved from the contributions of two philosophies: humanism associated with Alexander Meiklejohn (and others), and instrumentalism, promoted by John Dewey. Subsequent chapters discuss how in later decades, these philosophies shaped general and liberal education. The last chapter talks about current applications for general education and how changes in general education reflect what may be a fundamental change in society.

Nielsen, Elizabeth. (1989). Integrative Learning for Young Children: A Thematic Approach. Educational Horizons, 18-24.

• Nielsen discusses the history of the interdisciplinary idea, she defines concepts and provides thematic concepts for use in unit development.

North Carolina Department of Public Instruction. (1987). Integrated Learning What, Why, How. Instructional Services Curriculum Series, Number 1. (Report No. SP 029 918). Raleigh, NC. (ERIC Document Reproduction Service No. ED 290 759)

• This document provides both broad and specific rationales and procedures for developing interdisciplinary units. It describes the level of responsibility on the part of the state in supporting the efforts of classroom teachers, then moves into the school presenting an example of several teachers using a team approach to planning. The document outlines a variety of techniques used to develop integrated curriculum, including: webbing, topic organizers, goal files and modular thematic units. A sample plan for integration and supporting literature is included. This document is highly recommended.

Perkins, D. N. (1991, October). Educating for insight. Educational Leadership, 49(2), 4-8.

• Researchers found students often have superficial understanding of what has been taught. The author suggests approaches to teaching for deeper understanding and insight. According to the author, understanding is what people can do rather than something they have. To demonstrate, a learner may explain something in his/her own words, exemplify it in context, make analogies to novel situations, or generalize to another principle. Bruner calls this "going beyond the information given." Factors contributing to understanding are: knowledge, patterns of reasoning, and mental models (informative images and mental representations). Many researchers have shown that thoughtful learning in connections is needed for insight and flexible use of knowledge. The author recommends three elements for thoughtful teaching: 1) construct curriculum around generative topics that encourage connections; 2) deploy teaching methods that build toward understanding performances; and 3) emphasize assessment in context. This article is highly recommended.

Petrie, H. G. (1976). Do you see what I see? The epistemology of interdisciplinary inquiry. Journal of Aesthetic Education, 10(1), 29-43.

• In this article, Dr. Petrie describes the qualities that interdisciplinary teams need to be successful, as well as desirable personal and institutional qualities. The author believes that teams need: idea dominance (a clear focus for their work), a feeling of achievement, members interested in broad ideas, and a willingness to share biases and interests. Institutions should offer administrative support such as seed money, time, encouragement, peer recognition and realistic expectations. This work derives from the author's participation in an interdisciplinary seminar held in the Department of Engineering at the University of Illinois, in conjunction with the Social Studies and Humanities departments.

Polto, J. A. & Rhen, D. P. (1988, March). Full-scale curriculum integration. Vocational Education Journal, 63(2), 30-32.

• This article shows that test scores improve for students with non-academic orientations when competency-based vocational skills are presented with academic subjects. The authors also find that students respond more quickly and enthusiastically under these conditions.

Quattrone, D. F. (1989, Fall). A case study in curriculum innovation: Developing an interdisciplinary curriculum. Educational Horizons, 68(1), 28-35.

• The author, a middle school administrator, describes the evolutionary steps taken by the staff of three junior high schools to restructure into middle schools. All teachers shared their curriculums with each other, pared their disciplines down by 10% and planned an interdisciplinary unit as a team for one year before making it available to student participants. The unit themes of change, interdependence, prejudice and tolerance were chosen because they related to students' life experiences. This is highly recommended.

Shoemaker, B. J. (1989). Integrative Education: A Curriculum for the Twenty-First Century. Eugene: University of Oregon, Oregon School Study Council. (ERIC Document Reproduction Service No. ED 311 602)

• The author discusses current theories, future trends and needs, in addition to describing why, what and how interdisciplinary education should be perceived. The publication explains how the Eugene, Oregon Public Schools organized the K-12 curriculum into three, large, all encompassing themes and important concepts. This document is highly recommended.

Short, E. C. & Jennings, T. J. (1976, May). Multidisciplinary: An alternative approach to curriculum thought. Educational Leadership, 33(8), 590-594.

• This article is highly recommended for teachers who want to explore the question, "Why should I teach from a multi disciplinary perspective?" The authors say reform is needed due to the emerging global society, rapid change and information explosion. The multidisciplinary approach helps students see connections between knowledge, human processes, attitudes and values in regard to social problems.

Spady, W. G. & Marshall, K. J. (1991, October). Beyond traditional outcome-based education. Educational Leadership, 49(2), 67-72.

• Outcome-based education (OBE) places emphasis on success for all students. Most districts today have curriculum based objectives (CBO) rather than "outcomes of significance" for life beyond school. The authors describe three outcome-based paradigms. Traditional outcome-based education (OBE) encourages staff to use existing curriculum to decide what is important for students, once the CBOs are established. Curriculum instruction and assessment are then aligned. Proponents of Transitional OBE encourage districts to extend their vision beyond subject area content to address higher-order competencies essential in virtually all life and learning settings, such as critical thinking, effective communication, technological applications and complex problem solving. The Transformational OBE paradigm takes nothing about school today as a given, when addressing future-driven exit outcomes. It "represents the highest evolution of the OBE concept."

Sullivan, G. (1989, Summer). Curriculum in art education: The uncertainty principle. Studies in Art Education, 30, 225-236.

• This paper advocates for broad curriculum use of the principles of uncertainty, unpredictability, serendipity and conjecture-principles also inherent in the study of art or arts education. With this view the author analyzes curriculum in visual arts, art and society and future curriculum directions.

Tanner, Daniel. (1989). A Brief Historical Perspective of the Struggle for an Integrative Curriculum. Educational Horizons, 7-11.

• Tanner, a professor in the Graduate School of Education, Rutgers University, New Brunswick, New Jersey, provides an historical review of curriculum changes in the United States. Tanner clarifies the current confusion. He states: "An integrative core curriculum requires a new recognition of the interdependence of knowledge and its relevance to the life of the learner in a free society."

Vars, G. F. (1976). Block-time programs. In S. E. Goodman (Ed.), Handbook on Contemporary Education (pp. 384-388). New York: R.R. Bowker.

• This author's rationale for block-time programs is to enhance the guidance role of teachers, promote integration of subject matter from different disciplines and make better use of instructional time. Advantages of block-time are better student-teacher contact, reinforcement of skills and flexibility. Advantages and disadvantages are discussed.

Vars, G. F. (1991, October). Integrated curriculum in historical perspective. Educational Leadership, 49(2), 14-15.

• Integrative curriculums are delivered in three basic forms: using an all school theme or topic for a short period of time, grouping an interdisciplinary team of teachers who correlate respective subjects, and providing block-time in which teachers from different disciplines integrate their subjects. Vars believes the ultimate integrated curriculum is designed with students. More than 80 normative studies, carried out since 1942, showed that students in integrative programs perform as well or better on standardized achievement tests than students in separate subject classes.

Vars, G. F. (1986). Integrating the middle grades curriculum. Transescence: The Journal on Emerging Adolescent Education, 14, 3-5.

• This article summarizes ways to integrate curriculum. The author describes organizing systems such as correlating separate subjects, interdisciplinary teams and block-time. In addition, he describes the correlation, fusion and core approaches to organizing curriculum.

INTERDISCIPLINARY CURRICULUM DESIGN AND IMPLEMENTATION

Arts and General Studies Focus

The articles and books in this section offer broad definitions of interdisciplinary education in relation to the arts (dance, literary arts, media arts, music, theater and visual arts) and/or arts education. Included are general research conclusions, examples of model programs, ideas for the organization, and design and implementation of interdisciplinary approaches integrating the arts.

Adams, A. & Fuchs, M. (1985, November). The fusion of artistic and scientific thinking. Art Education, 38(6), 22-24.

• This article promotes the inclusion of technology within the liberal arts. It suggests that science and technology be used to teach art and art be used to teach science. The author finds a commonality in that science uses many of the same metaphoric thinking and perceptual skills found in visual arts and humanities education.

Akenson, James. (1991). Linkages of Art and Social Studies: Focus Upon Modern Dance/Movement. Theory and Research in Social Education, 19, 95-108.

• Author James Akenson, Dept. of Curriculum and Instruction, Tennessee Technical University, links the study of social studies to modern dance. The arts and social inquiry share commonalities of thinking. Both make use of logical and a logical thought processes. An example of an elementary level unit is provided.

Balzano, G. J. (1987). Reconstructing the curriculum for design. Machine-Mediated Learning: Music, Mathematics and Psychology, 2(1&2), 83-109.

• This author argues that computers be used as a catalyst for reconstructing the curriculum across disciplines and age levels. The author promotes reconstructing disciplines and "design-oriented" learning using the disciplines of music, mathematics and psychology as examples. Music includes aspects of mathematics and psychology when it is explored in a "design-orientation" computer environment.

Bernstein, Robert S. Root. (1991). Teaching Abstracting in an Integrated Art and Science Curriculum. Roeper Review, 13, 85-90.

• Bernstein demonstrates and provides usable examples of integrated art and science curriculum that teaches abstraction. Bernstein also provides a complete list of references.

Berney, T. D. & Barrera, M. (1988-1989). Language Development Through Holistic Learning (Mathematics, Art, Science, Technology, and Education Resources) (Report No. FL 018 546). Brooklyn: New York City Board of Education. (ERIC Document Reproduction Service No. ED 319 253)

• This document briefly outlines evaluation findings from "Project MASTER" (math, art, science, technology, and educational resources), a program serving Spanish speaking students in five elementary schools in the Bronx. Its holistic approach concentrates on science as a bridge to mastering English communication skills and mathematics, computer and critical thinking skills. It includes initiatives to foster students' involvement in cultural institutions in collaboration with the Bronx Council of the Arts and other local museums.

Beyer, B. K. & Gilstrap, R. (Eds.). (1982). Integrating writing and social studies, K-6. (Report No. SO 014 775). Boulder, CO: ERIC Clearinghouse for Social Studies/Social Science Education. (ERIC Document Reproduction Service No., ED 232 902)

• The authors advocate more opportunities for students to practice writing and analytical skills in social studies classes. They discuss why writing is an effective learning tool and necessary conditions for integrating writing. Suggestions are made on ways writing can be used in social studies lessons, including writing skills that need to be developed. An annotated bibliography lists several references.

Blaydes, John. (1991, June). The Pageant of the Arts: An Integrated Arts Program. Communicator, 21, 16-17.

• Blaydes article demonstrates the success of an integrated arts program. Blaydes and his staff of educators believes that the Pageant of the Arts' interdisciplinary approach provides indepth student experiences that build positive self-esteem, encourages self-discovery, and taps the creative strengths of each and every child.

Crane, L. (1982, November/December). African arts and the social studies. Social Education, 46, 502-507.

• This article makes a case for considering African arts as a component of social studies. The author cautions teachers against presenting false information about Africans and African art and suggests alternative ways to present African arts. One misrepresentation is that African art is static. The assumption is countered by citing a newly created dance from Zaire. The author outlines museum programs that are good sources for information that offer teacher resources. A bibliography of recommended books, curriculum units, handouts, manuals and films is listed at the end of the article.

Chris, Jerry. (1991, June). Five Proven Ways to Incorporate Art in Every Classroom. Communicator, 21.

• Chris describes five ways to incorporate art into any classroom. Incorporating the arts into the classroom provides an opportunity for individual, creative analysis. It provides an "opportunity to show students that education is much more than nuts and bolts, which if not immediately applicable, are useless."

Criscuolo, Nicholas. (1985). Creative Approaches to Teaching Reading Through Art. Art Education, 13-16.

• In this article, Criscuolo suggests a number of activities that interrelate art and reading. He provides fifteen creative approaches to teaching reading.

Eisner, E. W. (1982). Cognition and Curriculum: A Basis for Deciding What to Teach. New York: Longman.

• This book discusses two themes in education, the "back to the basics" movement and need for better methods to evaluate learning. The author outlines issues, concerns and effects of the "basic skills" approach in education. He looks at the important role the senses play in concept formation and relates this to curriculum content and educational evaluation. In the last chapter the author argues that the role of the arts in education should be broadened. Visual art, music, dance, drama and literary arts represent ways humans construct and convey meaning that capitalize on the use of different sensory systems. The author briefly discusses a method of evaluation based on what the evaluator wants to learn and encourages readers to look for non-mathematical measures when possible.

Eisner, E. W. (1985). The Educational Imagination. New York: MacMillan.

• The author promotes the use of the artistic process for understanding and reflecting on curriculum design and educational evaluation. He proposes curriculum development as both a practical and artistic undertaking. Educators can design educational programs in the manner of artists by perceiving and conceptualizing the whole and then working on different problems within that framework.

Eaton, M. (1985, October). Living, Learning and the Arts: Integrating Arts Into the Curriculum in Rural Schools. (Report No. RC 016 156). Paper presented at the Annual Rural Teacher Education Conference, Bellingham, WA. (ERIC Document Reproduction Service No. ED 279 481)

• This paper is a theoretical piece on why art is important in general education and how it enhances the learning process. The author explains her beliefs about the importance of the arts in five ways: 1) The rich content of artistic heritage allows students to develop an understanding and complexity of thought; 2) Art can be a powerful tool for learning, since it may "fix" information in a child's mind through visual or musical symbols; 3) The arts prepare the learner at an emotional level for cognitive content; 4) Artistic expression may be used as a means of demonstrating the understanding of knowledge; 5) Finally, the creation of art can make learning a joyful process.

Freyberger, R. M. (1985, November). Integration: Friend or foe of art education. Art Education, 38(6), 6-9.

• This article is an important history on the pros and cons of integration from the 1920's to the present. It reflects on the way curriculum integration occurred in the past, and presents several pitfalls. Many art educators believe that visual art is weakened by absorption into other subjects - and have fought for a sequential, separate, planned curriculum.

Greenwich Public Schools. (1989). Middle School Interdisciplinary Units Overview. Greenwich, Connecticut.

• Fifty Greenwich Public School teachers wrote interdisciplinary rationale and learning units in preparation for the three junior highs to restructure into three middle schools. The project was directed by David Quattrone, Assistant Superintendent of Schools, and Heidi Hayes Jacobs of Teacher College, Columbia served as principal consultant. The publication consists of a rationale, statement of purpose, list of common skills for grades 6, 7, and 8 in various subject areas and learning units for each grade. The unit themes include change, interdependence, prejudice and tolerance. The units describe how each subject area, (including the arts) incorporate the theme(s).

Hanna, J. L. (1992, April). Connections: Arts, academics, and productive citizens. Phi Delta Kappan, 73(8), 601-607.

• Using her own experience in dance and three decades of research in arts education, the author argues that arts education has merit that extends beyond aesthetic appreciation. Included are five examples connecting the arts to other arenas of learning: cognition, social relations, personal development, productive citizenship and aesthetic appreciation.

Harter, Paula and Nathalie Gehrke. (1989). Integrative Curriculum: A Kaleidoscope of Alternatives. Educational Horizons, 12-17.

• Integrative curriculum may be approached and implemented from a wide range of directions. the authors provide a tour of alternatives.

Hubbard, Guy. (1991). Integrating Computing into Art Education: A Progress Report. Art Education, 44, 18-24.

• The purpose of this article is to inform educators of the viable link between art and computers. The Authors describe visual expression and the use of a computer, graphic design and the computer, and equipment useful to an educator interested in integrating computer technology and art.

Johnson, P. (1983, April). Connecting patterns through environmental education. Educational Leadership, 40(7), 40-44.

• The author describes a high school ecology class which combines classroom activities and field study outside the classroom. Students studied the northeast shore of Maine's coast and published an oceanography newsletter to distribute to students across the United States.

Kindler, A. (1987, Fall). A review of rationales for integrated arts programs. Studies in Art Education, 29, 52-60.

• This paper reviews examples of unified arts programs that are integrated into the general curriculum. It specifically evaluates the relationship between theory and practice in six integrated arts programs. The author finds three fundamental assumptions in integrated arts programs: 1) there is a similarity across the arts; 2) incorporating the arts into other subject areas accelerates and facilitates the learning process; and 3) integrated arts programs are more economical than separate instruction in each area. The author argues that these assumptions have not been confirmed in practice or through statistical analysis and suggests educators direct their efforts towards more scientific evaluation methods.

King, S. P. (1988, February). Bronxville High: An "essential" school in process. Educational Leadership, 45(5), 35.

• The author, Assistant to the Principal at Bronxville High School in New York, tells about an interdisciplinary pilot program for ninth grade students. The program, entitled, "The Ancient World Through 1715," involved three teachers; a social studies, English and art teacher. She describes activities from one unit, problems produced by this learning approach and the positive results observed in students participation in the learning process.

Lounsbury, John. (1992, February). Music Universal Language, Universal Curriculum? Music Educators Journal, 78, 42-44.

• The author explains in this article, the benefits for all middle school students to be knowledgeable in music. Lounsbury discusses two types of reforms that are needed to permit music to "claim its rightful role in the middle level curriculum."

Martin, Floyd. (1991, June). The Missing Discipline: Teaching K-12 Art History. Design for Arts in Education, 92, (5) 39-45.

• Martin, an associate professor of Art History at the University of Arkansas, Little Rock, argues the importance of the currently missing discipline, Art History. Martin states that: "Talking or writing about art is one of the best ways to organize thought and consider shades of meaning."

Nelson, D. S. & Sigmon, B. L. (1982, February). Combining the arts and humanities. Educational Leadership, 39, 390-391.

• A program that unifies arts and humanities instruction for Richmond, Virginia elementary students is described in this article. Teaching specialists in art, music and physical education contribute activities that interrelate the three disciplines with activities that integrate other subject matter. School and community programs, and experiences with visiting artists and local arts organizations are mentioned. The system used for staff planning and development is discussed.

Neu, Regina. (1990, February). Collaborative Arts. School Arts, 80, 30-31.

• Neu, focuses her efforts on strengthening arts education by developing collaborative arts programs in which each individual art works with and supports another art. Neu discusses current successful collaborative programs.

O'Grady, T. J. (1989, Winter). Educating the artist in an interdisciplinary context. Journal of Aesthetic Education, 23, 87-93.

• This author advocates visual art students learn to perceive the aesthetic, stylistic and technical qualities of other art forms. In doing this students will be better able to appreciate and respond to "sister art forms" critically and possibly establish cross-disciplinary analogies.

Shetler, D. J. (1990, January). Crossing disciplinary lines for music learning. Music Education Journal, 76(5), 32-35.

• Through this article the author encourages educators to build interdisciplinary models to explore new ideas, advance knowledge and share experiences with other disciplines. He tells about the University Council on Interdisciplinary Studies at the University of Rochester, New York which recently sponsored a symposium on musical development and research, musical cognition, and music and medicine. Presentations indicated that music educators have much to learn from other disciplines.

Shier, J. H. (1990, September). Priority: Curriculum. Integrating the arts in the foreign/second language curriculum: Fusing the affective and the cognitive. Foreign Language Annuals, 23, 301-324.

• This author promotes the integration of the arts into foreign/second language curriculum to facilitate learning and teach the historical content. The author outlines program themes and activities in the literary, visual, video/film and theater arts using Discipline Based Art Education (DBAE) philosophy and relating these goals with those in foreign/second language lessons. Following the article are two reaction articles by Carolyn Andrade from Cincinnati Public Schools and Ann S. Richardson from Montgomery County (MD) Public Schools, who generally support the idea and make additional suggestions.

Stevenson, J. (1987). Weaving Connections with Language Arts. (Report No. CS 210 254). Grand Forks: North Dakota University, Center for Teaching and Learning. (ERIC Document Reproduction Service No. ED 277 040)

• The author, a school librarian, promotes ways librarians can assist teachers to integrate curriculum using language arts. She offers suggestions and questions to consider when planning, executing and evaluating the integrated learning process. Included is a bibliography listing of literature relating to the frontier.

Zinsser, W. (1988). Writing to learn. New York: Harper & Row.

• The author was invited to Gustavus Adolphus College in St. Peter, Minnesota where he found the school engaged in "writing across the curriculum." The program took seventy-five courses and made writing a required part of each course. Each chapter reviews a specific discipline and describes how writing became a part of the learning process.

INTERDISCIPLINARY CURRICULUM UNITS AND LESSON PLANS

Arts Focus

This section offers a diversity of ideas and examples for interdisciplinary classroom use. The focus is on enhancing student learning, cognition and/or thinking skills, by connecting learning objectives from music, visual arts, dance, theater and creative writing, with those of other disciplines. Also included are examples where the arts are used as tools for learning in other disciplines.

Bradtke, D., Regnier, B., & Mohr, J. (1985, September). An interdisciplinary unit comes to life. Clearing House, 59(1), 23-26.

• This article is about a group of six student teachers from various disciplines (physical education, language arts, music, theater, math and physical science) who develop an interdisciplinary unit based on the theme of mystery, emphasizing activities which promote curiosity, adventure and a driving need to know. Six areas of study are briefly described, and two, "Mystery in the Light of Poetry" and "What is Rain?," explain in more detail the procedures and methods as they were presented to students.

Dienes, Z. P. (1987). Lessons involving music, language, and mathematics. Journal of Mathematical Behavior, 6, 171-181.

• The author takes a step by step approach in describing a specific learning experience where words and dance steps are interwoven into an invented musical tune. Concepts learned in these subject areas and mathematics are also outlined.

Erickson, Mary. (1992). Lessons about Art in History and History in Art.

• Included in this report are lesson ideas and examples that integrate the teaching of history and art. Topics covered include, slavery, the American West, and African-American Art. An ordering information form is also available with this report.

Fineberg, C. (1987). Thinking Through the Arts: A Comprehensive Arts in Education Program. (Report No. SO 018 578). New York: New Rochelle City School District. (ERIC Document Reproduction Service No. ED 288 790)

• "Thinking Through the Arts" is a program in which certified specialists in art and music team with general studies teachers to provide regular sequential instruction in the arts. The program includes art production, aesthetic criticism, art history, and when possible, connections to the humanities, science and math curriculums are made. Key to this program is broad staff development fusing the arts into the general curriculum. This article is highly recommended.

James, M. & Zarrillo, J. (1989, July/August). Teaching history with children's literature: A concept-based, interdisciplinary approach. The Social Studies, 80, 153-158.

• This article describes how social studies units can be planned to address specific historical periods. The authors take the point of view that children can more effectively understand history through experiences which incorporate the humanities and children's literature, rather than through reading and memorizing a body of information. The article presents a 5th grade unit, "The Frontier: Native Americans of the Great Plains and the Prairie Pioneers," which focuses on the everyday lives and relationships between Native Americans and Pioneers. A book list is included.

Kauppinen, H. (1990, July). Environmental aesthetics and art education. Art Education, 43(4), 12-21.

• The author looks at the sensory, formal and symbolic qualities of the natural and built environment. Art education implications and activities including interdisciplinary studies which explore ethical, social, or economic effects on environmental aesthetics are suggested. Several photographs are included as illustrations.

Lee, R. T. (Ed.). (1987). The Ideabook for Arts in Education. (Report No. SO 018 408). Albany: New York State Education Department. (ERIC Document Reproduction Service No. ED 288 766)

• This publication is the first in a series of eight resource guides developed through the Arts in Education program of the Syracuse City School District, Syracuse, New York. This guide is filled with ideas on how to use themes (examples include: radio plays, dinosaurs and nocturnal animals) to relate visual art, music, media arts and other disciplines.

Lee, R. T. (Ed.) (1987). The Write Way On: Resource Guide 2. (Report No. CS 211 548). Albany: New York State Education Department. (ERIC Document Reproduction Service No. ED 299 579)

• This publication is one in a series of eight resource guides developed through the Arts in Education program of the Syracuse City School District, Syracuse, New York. Based on classroom teachers experience, this guide focuses on strategies and ideas for creative writing. It contains lesson and unit plans with resource and curriculum guides for basic skills practice in reading, writing and language arts. Appendixes provide evaluation instruments, a list of award winning writers and poets and strategies for locating and hiring artists.

Local theater as learning tool. (1990, January). Journal of Reading, 33, 304.

• This article describes the Los Angeles Theater Center's educational program, "Theater as a Learning Tool." Area teachers attend workshops and receive study guides containing lesson plans which integrate the play's subject into reading, writing and communication skills.

Mambo, Marjorie and Susan Wheatley. (1992). Curriculum Design: Whole Language through Music and Art.

• The authors have developed an integrated art and music curriculum model for whole language learning at the elementary level. Some themes included are; African Animal Tales, Native American Cultures, and the Far East. Large bibliography and lesson plans are also included.

McDaniel, S. V. (1990, October). How to fit in fine art. Learning, 19(3), 66-67.

• The author suggests incorporating art into social studies and science by selecting and including print/reproductions of similar subject matter. In language arts, she advocates comparing portraits using mood, styles or interpretation.

McQuade, F. (1986, September). Interdisciplinary contours: Art, earth, science, & logo. Science and Children, 24(1), 25-27.

• The focus of this article is on classroom experiences that combine earth science, the visual arts and computer skills. The author explains a unit where students study contour drawing, topographical maps and then create a clay environment using topographical features which they plot on a LOGO computer program.

Metal-Corbin, J. & Foltz, R. E. (1985, November/December). All my grandmothers could sing: An interdisciplinary and intergenerational choreography. Journal of Physical Education, Recreation & Dance, 56(9), 52-55.

• This article describes a performance piece in which dance, music, videography, costume, and scenic design is integrated with poetry. The dance choreography and music is based on a collection of poems by Nebraskan women entitled *All My Grandmothers Could Sing*. Artists throughout Nebraska collaborated with faculty and students from the University of Nebraska at Omaha to develop the piece. The article provides guidelines for collaborative teaming and a general outline of the program development process.

Moore, J. L. (1990, May). Creative thinking in music. Strategies for fostering creative thinking. Music Educators Journal, 76(9), 38-42.

• This article describes teaching approaches in music composition and improvisation which enhance and develop creative thinking skills. It discusses learning experiences for each developmental level, early childhood to secondary, and lists specific strategies for organizing a classroom environment and developing creative music experiences.

National Leadership Council. Growing Hope: A Sourcebook on Integrating Youth Service Into the School Curriculum (Appendix: section V, pp. 7-12). Roseville, MN.

• This publication lists several ways students and teachers can connect a variety of subject areas with needs in the community, such as writing letters to senior citizens or painting public murals around community themes. The activities provided strive to involve students with individuals from the community in which they live.

Schoener, J. E. (1990, April). Evaluation Section Report: Language development through holistic learning (Grant No. G008525048). New York: New York City Board of Education.

• This report describes a program where South Bronx students learn to attend to aspects of their surrounding environment through the perspective of local architects, historians, photographers and artists. Students participated in order to develop their self-expression and to become better acquainted with careers in arts or science.

Seely, C. & Hurwitz, A. (1983, May). Developing language through art. School Arts, 82(9), 20-22.

• This article explains a program for non-English speaking children, ages 6 - 17, who attended a summer arts center in Newton, Massachusetts. Teachers in the program were visual arts, drama and language specialists who used the arts as tools to assist children in learning the English language. Discussions, writing and labeling artwork were several of many processes used to enhance learning.

Sensenbaugh, R. (1990, February). Process writing in the classroom. Journal of Reading, 33, 382-383.

• This article looks at writing as a means to engage students in analytical, persuasive and evaluative skills while learning about a specific course content. The author outlines the "process approach" model which emphasizes the writing process rather than a final product. An activity in which students write a newspaper from the perspective of the Civil War era is described.

Simonis, D. G. (1989, November/December). Science and the art of Georgia O'Keeffe. Science Activities, 26(4), 19-21.

• This article looks at the similarities between artistic and scientific visions, which proceed from concrete observations to abstract interpretation. It focuses on patterns in physical and earth science, and on the human response to nature and art, featuring O'Keeffe's paintings of flowers. A lesson which includes drawing natural objects and a follow-up writing activity is presented.

Smout, B. (1990, February). Reading, writing, and art. Reading Teacher, 43, 430-431.

• The author is a teacher who offers practical ideas for integrating reading, writing and art in the classroom. The article includes: a chart of themes, lists of materials, examples of reading-writing connections and a list of picture books which correspond with suggested visual art activities.

Stotsky, S. (1990, March). Connecting writing and reading to civic education. Educational Leadership, 47(6), 72-73.

• The author of this article planned and directed a one-week workshop for administrators and teachers. The workshop, entitled, "Institute on Writing, Reading and Civic Education," was held at the Harvard Graduate School of Education. Since writing is part of government work and essential in public speaking, she advocates that citizens can best learn how to participate in civic or political life through experiences in writing. Suggested ways students can become involved are provided, such as writing thank you letters to legislators and advocating a position on a public issue.

Sunal, C. S. & Hatcher, B. A. (1986, April/May). How to do it: Studying history through art. Social Education, (Suppl. pp. 1-8).

• This article promotes exploration of historical artworks as resources for social studies. The authors believe that examining past eras and ethnic groups helps develop children's social knowledge and understanding of cultural symbols. They explain how to set up an interdisciplinary program which integrates themes of family, work and cowboy life. Included are specific artworks, questions which promote looking and thinking and a description of relevant follow up activities (such as dramatic play in period costumes). A list of addresses where prints and reproductions can be purchased is included.

Thoms, H. (1985, November). Creative writing as dialectical interplay: Multiple viewings of a painting. Art Education, 38(6), 10-12.

• In this article secondary students learn creative writing techniques by exploring a single painting. The author provides examples of students' writing throughout the process of viewing and interpreting the painting.

Weigand, H. (1985, November). From science into art. Art Education, 38(6), 18-21.

• This article discusses the positive results of a ten week integrated art/science study to determine whether integrated learning improves attitudes toward science and art. Drawing and science experiences exploring camouflage, regeneration and metamorphosis, are explained using examples of student work.

Willett, Leslie. (1992, April). The Efficacy of Using the Visual Arts to Teach Math and Reading Concepts.

• This study investigated the use of art lessons to enhance the comprehension of specific concepts taught in a school curriculum. Results indicated that students that studied math concepts through art scored higher than students taught the same math concepts in a traditional delivery. Sample lessons for interdisciplinary math and art art included in the report.

Yaffe, S. H. (1989, March). Drama as a teaching tool. Educational Leadership, 46(6), 29-32.

• The author provides examples of improvisational drama which is integrated into general studies from kindergarten through high school (and includes gifted and at-risk students). He argues that drama helps students personalize knowledge, move from facts to a greater sense about peoples' lives and enhances oral skills in writing.

INTERDISCIPLINARY CURRICULUM UNITS AND LESSON PLANS

Non-arts Focus

This section provides interdisciplinary examples from disciplines other than the arts such as science, mathematics, social studies, English and language arts.

Casagrande, D. O. & Croddy, W. S. (1985). Language as the focus of an interdisciplinary course in composition. Journal of General Education, 37, 144-157.

• The authors describe an interdisciplinary course in composition for a university requirement which draws from various subject areas. Faculty tried to find a common concept or methodology, and finding none, agreed on using the language within each discipline as the unifying concept. While evaluating the course, the authors noticed higher student grades improved writing and student receptivity.

Corbin, D. E. & Leach, M. M. (1985, November/December). Teaching a community health course. An interdisciplinary approach. Journal of Physical Education, Recreation & Dance, 56, 56-59.

• This article looks at an undergraduate interdisciplinary community health course for health educators and exercise science majors. The course emphasizes the interdisciplinary aspects of health and life. To provide a balance between science and humanities, the arts are used to express ideas and concepts.

Fagan, E. R. (1987, September). Interdisciplinary English: science, technology, and society. English Journal, 76, 81-83.

• This article focuses on Science, Technology and Society (STS), an interdisciplinary program established in the 1970s and suggests ways to combine it with writing objectives in English. A unit is described in which an eighth grade English teacher uses issues regarding animals to help students understand the interconnectedness of life and develop communication, critical thinking and decision-making skills. Students displayed their projects at a local mall and explained their findings to the public.

Gillespie, J. S. (1990, October). Reliving the depression: Integrating English and social studies. English Journal, 79, 49-64.

• The author is a seventh grade language arts teacher, working with a social studies teacher to develop a two-month unit about the Great Depression. Activities include reading literature of the period and producing radio programs and news reels. Throughout the article there are samples of student work and comments about the activities. The author provides an annotated bibliography of books and radio plays about the Great Depression.

McLaughlin, M. B. & Wright, D. R. (1986). An interdisciplinary course on South Africa, or problems we forgot to anticipate. Journal of General Education, 38, 18-27.

• The authors' article tells of their experience team-teaching an interdisciplinary, college-level course on South Africa from separate perspectives in history and literature. This journalistic account of their mistakes and difficulties leads them to important questions such as, "How can we best combine two disciplines without distorting either?" and to some obvious solutions which include exploring the relationships between history and literature.

Read, D. J. & Smith, H. M. (1982). Wordless History Books — an Interdisciplinary Approach to Teaching Upper Elementary Students. (Report No. CS 209 292). (ERIC Document Reproduction Service No. ED 261 398)

• Five books which concentrate on the time of King Edward in England are used as sources of inspiration. The author suggests activities such as reading books, learning about cars, studying holidays and preparing foods of England.

Smith, D. J. (1990, March). Taking language arts to the community. Educational Leadership, 74-75.

• The author is a high school English teacher who developed a program entitled "English Outreach," which seeks to broaden students' community experience and involvement while developing their English skills. Students participated in several community-based programs, including a library story hour for preschool children, reading poetry at senior citizens' homes and performing puppet shows. The author believes that students were motivated to think about and employ new English skills through their experiences in public speaking and writing.

Zoller, U. (1986/87, Winter). The Israeli environmental education project: A new model of interdisciplinary student-oriented curriculum. Journal of Environmental Education, 18(2), 25-31.

• The author, a University professor of science education, describes an interdisciplinary environmental project designed to prepare Israeli high school students to understand and act responsibly on environmental issues. Students are asked to look at actual environmental problems in Israel, discern relevant information, and evaluate and draw conclusions which might suggest ways to solve the problems. Information is provided on a variety of case studies. As part of this project, teachers choose one case study (such as the water supply in Jerusalem) and encourage student exploration of the problem from many points of view.

EVALUATION, RESEARCH AND ASSESSMENT

This section presents anecdotal and empirical studies on the attitudes and perceptions of administrators, teachers and students who have experienced interdisciplinary learning. It also includes methods and strategies for assessing interdisciplinary learning and outcomes.

Banta, T. W. & Pike, G. R. (1989). Methods for comparing outcomes assessment instruments. Research in Higher Education, 30, 455-469.

• This article outlines strategies for use by faculty in comparing the efficacy of outcomes assessment instruments in gauging program effectiveness. The University of Tennessee, Knoxville, where students take the COMP (College Outcome Measures Project), is studied by comparing COMP scores with students' scores from other tests, academic profiles and perceptions. Several methods for evaluating the appropriateness of outcomes assessment instruments are included: 1) content analysis of the instrument by faculty; and 2) questions for students to elicit their perceptions about the instrument.

Beggs, D. L., Mouw, J. T., & Barton J. A. (1989, December). Evaluating gifted programs: Documenting individual and programmatic outcomes. Roeper Review, 12(2), 73-76.

• The authors develop evaluation strategies for a gifted program where the goals are directed toward a common set of outcomes. The article places importance on the alignment of goals with evaluation methods. Examples include assessing artistic ability, using a portfolio assessment that includes a systematic way of judging the quality of work and measuring gains in critical thinking abilities using pre- and post-testing.

Barman, C., Harshman, R. E., & Rusch, J. J. (1982, October). Attitudes of science and social studies teachers toward interdisciplinary instruction. American Biology Teacher, 44, 421-426.

• This article presents a study which evaluates social studies and science teachers' attitudes toward interdisciplinary teaching. The majority of teachers surveyed (77%) supported the concept as an important educational goal and 90% recommended that emphasis be placed on the interaction between science, technology and society. The authors recommend Project SCATE (Students Concerned About Tomorrow's Environment), a program developed for Iowa secondary students to investigate environmental problems and participate in political action to resolve them. This article is highly recommended.

Cotton, K. (1982). Effects of Interdisciplinary Team Teaching. Research Synthesis. (Report No. SP 022 364). Portland, OR: Northwest Regional Educational Laboratory. (ERIC Document Reproduction Service No. ED 230 533)

• This research finds interdisciplinary teaching as effective as other methods in enhancing student achievement on standardized measures. The author advocates interdisciplinary teaching for middle school, since it seems to cultivate a desire to learn and shows no adverse effects academically. This article is recommended for middle school teachers and administrators.

Dorn, C. M. (1990, January/February). An annotated bibliography on evaluation and testing in visual arts education. Design for Arts in Education, 91(3), 34-41.

• This excellent resource is divided into four sections. It suggests references that deal with the general problems of evaluation, construction and use of tests, and philosophical and aesthetic issues. It also includes a collection dealing with issues and problems related to testing and evaluation in visual arts education.

Eisner, E. W. (1985). Instructional and expressive educational objectives: Their formulation and use in curriculum. In E. Eisner (Eds.), The Art of Educational Evaluation: A Personal View (pp. 39-70). London: The Falmer Press.

• This chapter covers the history of educational objectives. The author differentiates between instructional and expressive objectives. Expressive objectives do not specify what students are to learn, but they describe and present an educational situation of problems and tasks with which students explore and cope. At the end of the chapter, Dr. Eisner responds to art educators' critique of this work.

Lehman, J. R. & McDonald, J. L. (1988, December). Teachers' perceptions of the integration of mathematics and science. School Science and Mathematics, 88, 642-649.

• This article reviews a study which assesses whether an integrated approach changes student teachers' perceptions toward the integration of mathematics and science. It also compares the perceptions of student teachers with those of practicing teachers.

Mansfield, B. (1989, July/August). Students' perceptions of an integrated unit: A case study. Social Studies, 80(4), 135-140.

• The author describes an integrated unit based on the theme, "Life in Egypt," for upper elementary students. The author contends ongoing evaluation, an integral part of the unit, enhanced student commitment to the learning experience.

Minnesota Center for Arts Education (May, 1992). Perspectives on Interdisciplinary Education. Focus group study conducted in Spring, 1991.

• This study used a focus group format to assess student and teacher perceptions about the interdisciplinary education program at the Center's Arts High School. The study resulted in 12 primary conclusions which include some of the following: a) Interdisciplinary education is not extensive in public eduction systems; b) Arts High School students and faculty share a definition of interdisciplinary education; c) The mission for interdisciplinary education is compelling; d) The majority of interdisciplinary education at the school related the arts and non-arts areas. Students and some faculty express interest in more interarts education; e) Teachers and students express significant concerns about assessment of interdisciplinary education; and f) Team teaching is an integral part of the separate interdisciplinary studies classes and is frequently essential in other settings as well. For copies of this report please contact the Minnesota Center for Arts Education, 6125 Olson Memorial Highway, Golden Valley, MN 55422.

This is a project of the Minnesota Center for Arts Education - Resource Programs.
The Center is an agency of the State of Minnesota.

This publication available in Braille and large print.